Energy Efficiency and Renewable Energy
Federal Energy Management Program

How to Buy an Energy-Efficient Computer Printer

Why Agencies Should Buy Efficient Office Equipment

- *Executive Order 13123 and FAR part 23 direct agencies to purchase products in the upper 25% of energy efficiency, including all models that qualify for the EPA/DOE* ENERGY STAR® *product labeling program.*
- *Agencies that use these guidelines to buy efficient products can realize substantial operating cost savings and help prevent pollution.*
- *As the world's largest consumer, the federal government can help "pull" the entire U.S. market towards greater energy efficiency, while saving taxpayer dollars.*

Federal Supply Source:

- General Services Administration (GSA)
  www.fss.gsa.gov

For More Information:

- DOE's Federal Energy Management Program (FEMP) Help Desk and World Wide Web site have up-to-date information on energy-efficient federal procurement, including the latest versions of these recommendations.
  Phone: (800) 363-3732
  www.eren.doe.gov/femp/procurement
- Environmental Protection Agency (EPA) has ENERGY STAR® product listings.
  Phone: (888) STAR-YES (782-7937)
  www.energystar.gov/products
- TCO is a labeling program for computers, monitors, and other office equipment that includes energy efficiency, environmental, and ergonomic criteria, as well as low electro-magnetic emissions.
  Phone: (312) 781-6223
  www.tco-info.com
- Buyers Lab, Inc. publishes detailed printer test reports and a *Printer Specification Guide.*
  Phone: (201) 488-0404
  www.buyers-lab.com
- Lawrence Berkeley National Laboratory maintains a Web site devoted to office paper reduction issues and strategies.
  eetd.lbl.gov/paper
- Lawrence Berkeley National Laboratory provided supporting analysis for this recommendation.
  Phone: (202) 646-7950

Efficiency Recommendation

Printer Speed	Recommended "Sleep" Mode	
	Laser B/W + All Inkjet[a]	Laser Color[b]
≤ 10 pages/min.	10 watts or less	35 watts or less
11-20 pages/min.	20 watts or less	45 watts or less
21-30 pages/min.	30 watts or less	70 watts or less
31-44 pages/min.	40 watts or less	70 watts or less
> 44 pages/min.	75 watts or less	70 watts or less

a) Includes both black-ink and color inkjets, and printer/fax combinations.

b) Also includes LED and thermal transfer color printers. Note that most higher speed color printers are digital, network-capable copier-printer combinations.

Definition

"Sleep" mode refers to a low-power standby condition, which is entered automatically after a set period of inactiviy. The printer's active mode is restored when a print command is received.

Where to Find Energy-Efficient Printers

The federal supply source for printers is the General Services Administration (GSA). GSA's on-line ordering system, *Advantage!,* can be used to select and order printers. Whether buying from GSA or a commercial source, make sure that the model you order qualifies for the ENERGY STAR® label. All ENERGY STAR printers meet this Recommendation, though some come without duplexing capability (see "Buyer Tips," below). Check the EPA's list to see which printers qualify for the label (see "For More Information").

Buyer Tips

If you are buying a medium- or high-speed laser printer that produces at least 6,000-8,000 pages per month, choose a model with duplexing (two-sided printing) capability. Duplexing is often a standard feature above 40 pages/minute. Duplexing printers save on paper costs (see "Printer Cost-Effectiveness Example" on reverse side), as well as providing other benefits such as lower postage costs, reduced file space, etc. The added cost of a printer duplex attachment is often repaid in two years or less.

Usage Tips

Make sure the power management and duplexing features of your printer have been "enabled" at the printer and that duplexing is the default setting within each user's software. Set the "wait time" prior to sleep mode as short as possible, consistent with user needs.

Even for printers with a low-power sleep mode, you can save more energy if you manually shut them off completely at night and on weekends. A few printer models do not have a manual on/off switch; these can be shut off using an external "power strip" (surge protector).

Networked systems that allow several nearby users to share a single (faster) printer generally save time, cost, and energy compared with each computer having a dedicated printer.

In some cases, an older printer that does not have an ENERGY STAR sleep mode can still be power-managed using an external control device. External controls switch the printer off (rather than into sleep mode) after a preset time, and switch it on again when a "print" signal is received. EPA's web site and hotline provide a list of external printer controls.

Printer Cost-Effectiveness Example
(17 pgs./min. Networked Laser Printer)

Performance	Base Model	Recommended Level (with duplexing)
Annual Energy Use	370 kWh	144 kWh
Annual Energy Cost	$22	$9
Lifetime Energy Cost	$110	$40
Lifetime Energy Cost Savings	–	**$70**
Annual Paper Use	72,000 sheets	54,000 sheets
Annual Paper Cost	$360	$270
Lifetime Paper Cost	$1,900	$1,400
Lifetime Paper Cost Savings	–	**$500**
Lifetime Total Cost Savings	–	**$570**

Definition

Lifetime Energy or Paper Cost is the sum of the discounted (present) value of annual energy or paper costs based on average usage and an assumed printer life of 6 years. Future electricity price trends and a discount rate of 3.3% are based on federal guidelines (effective from April, 2001 to March, 2002).

Cost-Effectiveness Assumptions

Annual energy use in the above example is based on typical office operating practices, including a 9.5 hour work day with 8.5 hours of standby (inactive) time and 268 operating days per year. Also, the example incorporates the assumption that 70% of all shared, networked printers are left on overnight and on weekends. The modeled printer output is 6,000 images per month. In the recommended model, 50% of images are assumed to be duplex-printed. The assumed electricity price is 6¢/kWh (inlcuding demand charges). The average paper cost is assumed to be 0.5¢/sheet.

Using the Cost-Effectiveness Table

In the example shown above, a 17 pages-per-minute printer at the recommended efficiency level (with duplexing) is cost-effective if its purchase price is no more than $570 above the price of the Base Model.

What if my Electricity or Paper Price is different?

To calculate Lifetime Energy Cost Savings for a different electricity price, multiply the savings in the above table by this ratio: $\left(\frac{Your\ price\ in\ ¢/kWh}{6.0\ \ ¢/kWh}\right)$. To calculate Lifetime Paper Cost Savings for a different paper price, multiply the savings in the above table by this ratio: $\left(\frac{Your\ price\ in\ ¢/sheet}{0.5\ \ ¢/sheet}\right)$.

FEMP FEDERAL ENERGY MANAGEMENT PROGRAM